



## Comprehensive Conservation and Management Plan

### Pollution Prevention and Reduction

#### Goals:

- Promote mechanisms to prevent pollution at its source.
- Where pollution prevention is not possible, control and reduce pollutants entering the Estuary.
- Clean up toxic pollution throughout the Estuary.
- Protect against toxic effects, including bioaccumulation and toxic sediment accumulation.

#### Problem Statement

Human activities have greatly affected many aspects of the Estuary, including its geography, hydrology, and ecology. The activities relevant to the discussion of pollutants in the Estuary include the introduction of sediments and metals from mining operations, the discharge of domestic sewage, the diversion of fresh water, and the release of persistent, toxic pollutants in industrial discharges and surface runoff.

Each year, an estimated 5,000 to 40,000 metric tons of sixty-five or more toxic pollutants are disposed of in the Estuary. Pollutants of concern include trace elements, such as copper, nickel, silver, and zinc, and synthetic organic compounds, such as organochlorine pesticides, polychlorinated biphenyls (PCBs), and polynuclear aromatic hydrocarbons (PAHs). These pollutants are produced and mobilized by numerous industrial, agricultural, natural, and domestic activities within the catchment. Pollutants are conveyed to the Estuary by rivers, storm drains, runoff from urban and non-urban lands, wastewater treatment plants, industrial facilities, atmospheric deposition, discharges from maritime vessels, underground seepage, and disposal of dredged material.

To date, most pollution control efforts have focused on direct discharges of sewage and industrial waste. While these efforts continue, controlling pollutants released into urban and non-urban runoff has also become a priority. Pollutants in urban runoff originate from transportation activities and other sources. Pollutants are deposited onto urban surfaces from the atmosphere and flushed through storm drains by rainfall, landscape irrigation, and wash-down practices. Aside from San Francisco and a small part of Sacramento, where most urban runoff is treated along with municipal wastewater, polluted runoff from urban areas flows untreated into the Estuary.

Non-urban runoff is defined as surface runoff from agricultural lands, range lands, and forests. Rainfall and irrigation water flush pesticides and other agricultural chemicals into drains, and the runoff flows untreated into the Estuary. Non-urban runoff also includes pollutants leached from soils by rain

or irrigation (e.g., selenium), drainage from mine sites, and sediment from eroded soils.

Pollutants are distributed within the Estuary by a combination of physical, chemical, and biological processes. Many persistent pollutants become bound to particulate matter that settles near discharge points and accumulates in areas of sediment deposition with pollutants from past industrial activities. Some of these areas have been identified as "toxic hot spots." Pollutants can become concentrated in organisms directly from the water column and by ingestion of contaminated food. These two processes can lead to high concentrations of pollutants in tissues even though concentrations in the water are low.

The *Status and Trends Report on Pollutants* findings include the facts that:

- Available data from repeated analyses of sediments, sediment cores, mussels, and other animals have demonstrated few pollutant reductions;
- Tissue analyses indicate that the concentrations of ten trace elements, DDT, and PCB sampled in the Estuary's mussels, clams, fish, and birds are significantly elevated compared to samples collected elsewhere in the state;
- PCBs appear to be reducing reproductive success in starry flounder in the eastern portion of Central Bay. PCBs and DDT in black-crowned night heron eggs have been correlated with decreased embryo size and eggshell thickness, respectively; and
- With urban land use expected to increase by 37 percent by 2005, pollutant loading from all sources is expected to increase substantially.

Many effects related to pollutants in the Estuary have been identified, although this evidence is limited by our ability to detect toxic effects and by the complexity of the estuarine ecosystem. While measuring concentrations of pollutants in water, sediments, and animal tissue is technically achievable, determining the overall effect of a pollutant on individual organisms is often extremely difficult. Even more difficult to determine are pollutant effects on populations of a single species or on the entire aquatic community. Evidence of pollutant effects in the Estuary is sufficient, however, to designate much of the Estuary as "threatened or impaired" by combinations of different toxic pollutants.

Persistent pollutants of concern in the Estuary have been increasingly influenced by chemical use and freshwater flow patterns. In contrast to trends in some biodegradable pollutants, trends in persistent pollutants are affected more by the use of chemicals than by treatment methods. Concentrations of toxic metals in sediments and certain organisms are high in some urban industrial portions of the Estuary, and concentrations of most metals do not appear to be decreasing. The concentration of these metals corresponds with their continued use within the catchment despite the treatment of wastewater. Unless patterns of chemical use and land development change, pollutant loads discharged into the Estuary via runoff are likely to increase. Increased diversion of freshwater inflow may also further increase the concentration of some pollutants of concern in the Estuary.

#### **Existing Management Structure**

The U.S. Environmental Protection Agency (U.S. EPA) and the California State Water Resources Control Board (SWRCB) share authority to regulate sources of pollution to the Estuary. The federal Clean Water Act (CWA) and

its amendments establish the programs used to control pollution in the Estuary. The CWA is administered by U.S. EPA, but actual implementation in California is performed by the SWRCB and Regional Water Quality Control Boards (RWQCBs). The San Francisco Estuary is within the jurisdiction of the San Francisco Bay and Central Valley Regional Water Quality Control Boards.

In California, the SWRCB shares authority with the RWQCBs for implementation of the CWA and the Porter-Cologne Water Quality Control Act. The Regional Boards conduct planning, permitting, and enforcement activities under the guidance of the State Board. Programs administered by the State and Regional Boards include the National Pollutant Discharge Elimination System (NPDES) program, which regulates municipal and industrial wastewater discharges, and the Nonpoint Source Program, which develops strategies to eliminate pollutant sources before discharges reach conveyances. The state also establishes water quality numerical criteria for toxic pollutants for which U.S. EPA has published water quality criteria.

The Regional Boards prepare Water Quality Control Plans for implementing the state and federal policies for water quality conditions in the region. The plans specify beneficial uses of the receiving waters, water quality objectives, and the strategies and schedules for achieving these objectives. The plans are periodically revised.

In 1987, the State Board started the Bay-Delta Hearings to develop water quality objectives for the Estuary and consider alternate allocations of water rights to achieve the objectives. The Bay Waters Protection and Toxic Cleanup Program was established by state legislation to identify toxic hotspots and plan their cleanup or mitigation.

The U.S. Army Corps of Engineers manages the discharge of dredged material through a permit process. Applicants for permits are required to satisfy conditions designed to prevent unacceptable impacts to the aquatic environment, including release of pollutants during dredging and disposal of material. U.S. EPA reviews such permits and can object to their issuance. The Regional Boards are also actively involved in the regulation of pollutants from dredging activities. They must certify that such activities meet all applicable water quality standards.

The National Oceanic and Atmospheric Administration (NOAA) undertakes programs in estuarine and coastal assessment, research, and prediction. Assessment activities include monitoring ambient levels of pollutants in the sediment and water and research on the effects of pollutants on estuarine habitat, organisms, and human health. NOAA provides recommendations to state and federal agencies on regulatory decisions.

### **Recommended Approach**

Historically, efforts to reduce the input of pollutants to the Estuary have focused on treating direct discharges rather than examining the use of toxic chemicals. Given the environmental problems and the great expense associated with new treatment technologies to control persistent pollutants, pollution prevention techniques represent a promising option for achieving reductions of pollutant loads. Reduced use of toxic chemicals resulted in a 70 to 90 percent reduction in chromium and lead discharges at a local petroleum refinery and was associated with lower copper discharge rates from a number of metal plating and electronics manufacturing plants.

This program proposes both the full implementation of existing regulatory programs and, where necessary, the development of new initiatives that address activities that result in pollution. Many programs are currently under-funded, unintegrated, and inadequately enforced. We have identified actions to better integrate regulatory programs and better enforce existing statutes. At the same time, many potential mechanisms for pollution control remain unexplored. After evaluating proposals for new strategic approaches to pollution control, we have identified policy initiatives that focus on pollution prevention at its source. Pollution prevention will be encouraged by implementation of incentives and enforcement of toxics regulatory requirements. One of the priorities of this program is identifying non-regulatory approaches to assist public and private sector dischargers address their needs at the source.

Both scientific and strategic considerations are needed to solve pollutant issues in the Estuary. Monitoring provides the scientific evidence of pollutant impacts required by decision-makers as they shape regulatory actions. A better long-term, iterative approach to addressing the problems related to pollutants in the Estuary must be established.

Finally, an integrated management approach should to be adopted to attain and maintain water quality sufficient to ensure that estuarine species and human health are fully protected from pollutants and anthropogenic toxicity that threatens estuarine populations, habitats, and food supplies. This action plan proposes a three-tiered program for addressing pollution that emphasizes pollution prevention, provides for control of pollutants that cannot be avoided, and finally recommends remediation of existing contamination. A management strategy, which advocates addressing issues comprehensively by watershed, is included within each of the programmatic tiers. This action plan identifies needs for individual watersheds as well as the Estuary as a whole. Watershed management is a planning tool which complements, but does not supersede, existing regulatory programs.

## **Pollution Prevention and Reduction Actions**

### **A. Pollution Prevention**

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#### **Objective PO-1**

***Reduce pollutants entering into the Estuary by establishing a pollution prevention program.***

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#### **ACTION PO - 1.1**

***Establish specific goals for reducing the discharge of toxic pollution over time and discourage reliance on toxic materials. All dischargers should implement measures to reduce pollutants at their source.***

**Who:** California legislature, U.S. Congress, Cal EPA, California Department of Food and Agriculture, California Department of Fish and Game, State Water Resources Control Board, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, U.S. Soil Conservation Service, and the private sector

**What:** Building upon the pollution prevention audits required under the 1991 Senate Bill 14, which focuses on hazardous waste and right-to-know reports, pollution prevention should be a primary element in all watershed management plans and regulatory actions. All dischargers should participate in a pollution prevention program, and Publicly Owned Treatment Works

should require industrial, commercial, and residential sources connected to their systems to implement pollution prevention measures. Pollution prevention measures should be incorporated into all levels of government planning and enforcement programs. An active public outreach program is also fundamental to a successful pollution prevention program.

A comprehensive pollution prevention program should include the following strategies, where practicable:

- 1) Redesign or reformulation of products;
- 2) Substitution of raw materials or alternative chemicals that introduce smaller quantities of hazardous substances into agricultural and industrial production processes;
- 3) Improved process technology and equipment to alter the primary source of waste generation;
- 4) Improved plant operations (housekeeping); and
- 5) Recycling of polluted substances at the site of their generation (closed loop recycling).

Pollution prevention programs should include a comprehensive toxic reduction program, with defined goals for reducing the loading of toxic pollutants over time, identification of areas where pollution prevention techniques should be implemented, and monitoring and reporting of success in meeting these goals.

**When:** 1993

**Cost:** \$2,700,000 estimated total (\$300,000 federal and \$2.4 million state)

#### **ACTION PO - 1.2**

***Recommend institutional and financial changes needed to place more focus on pollution prevention.***

**Who:** California legislature, regulatory agencies, and local agencies

**What:** Economic incentives should be created to discourage reliance on toxic materials and reduce the discharge of toxic pollutants over time. Resources are needed to fund urban runoff control, pretreatment, and waste minimization programs that are currently being started by federal regulations, state requirements, and local government initiatives. Revenue enhancement measures, in the form of additional fees and direct cost measures, could provide local agencies with needed resources to adequately implement these programs.

The following economic incentives to encourage pollution prevention should be evaluated:

- 1) Deposit/rebate systems (to encourage recycling of hazardous consumer products that might otherwise be released to the environment); and
- 2) Effluent taxes based on mass loading to stimulate waste minimization by dischargers.

Economic measures for agricultural discharges should incorporate incentives in water pricing to reduce sediment loading and improve water quality. Provisions of the Food Security Act and the Agricultural Credit Act should be used more aggressively to conserve soils on erosion-prone lands. Voluntary retirement of marginal agricultural lands that currently yield a high discharge of toxic elements, such as selenium, should be encouraged through public/private joint ventures.

**When:** 1993

**Cost:** \$60,000 estimated total (\$60,000 federal)

### **ACTION PO - 1.3**

***Develop environmental audit procedures for all significant users and/or producers of toxic substances.***

**Who:** California EPA, State Water Resources Control Board, San Francisco Bay Regional Water Quality Control Board, and Central Valley Regional Water Quality Control Board

**What:** California EPA should develop uniform requirements for environmental audits for industrial use of toxics and discharge. The need for legislation to legally mandate pollution prevention audits should be evaluated. Audits could be conducted by the user or discharger. Information collected under this program should be used to encourage corporate management accountability as well as to provide regulatory agencies with data needed to conduct mass balance analyses of toxics use and wasteload allocations within the Estuary. The program should include a mandatory annual reporting of pollution prevention activities.

The Central Valley and San Francisco Bay Regional Water Quality Control Boards should make pollution prevention audits mandatory for all industrial facilities that discharge significant toxic pollutants into the Estuary. The audits should be mandated in National Pollution Discharge Elimination System (NPDES) permits and POTW pretreatment programs.

**When:** 1993

**Cost:** \$4 million estimated total (\$4 million state)

### **ACTION PO - 1.4**

***Improve agricultural practices that reduce introduction of pollutants into the Estuary.***

**Who:** Department of Water Resources (DWR) and water districts, landowners, Soil Conservation Service, and the state legislature as needed

**What:** DWR and the water districts should coordinate efforts to improve agricultural practices that contribute to the introduction of pollutants into the Estuary. Using best available information, Best Management Practices (BMPs) and water management plans should be developed and implemented.

Agricultural practices should be developed and implemented to encourage efficient water use to reduce pollutants entering the estuarine system.

**When:** As soon as possible

**Cost:** \$19,060,000 estimated total (\$9,060,000 federal and \$10 million state)

#### **ACTION PO - 1.5**

***Reinforce existing programs and develop new incentives where necessary to reduce selenium levels in agricultural drainage.***

**Who:** Department of Water Resources, water districts, Bureau of Reclamation (210 Authority), Soil Conservation Service, U.S. EPA (319 program), and the Regional Water Quality Control Boards

**What:** A strategy based upon existing programs and new incentives should be implemented to reduce selenium levels in agricultural drainage. Components include evaluation of attainment of selenium standards through non-structural methods and on-farm practices before use of drain extensions, use of waste discharge permits by the Regional Boards where cooperative methods are ineffective, and low-cost loans. The San Joaquin Valley Drainage program should be implemented and supported. Use of incentive programs should include awards, developing model programs, educational tools, such as the Agwater Program developed by Cal Poly University, and recognizing innovative water district programs.

**When:** As soon as possible

**Cost:** \$10,560,000 estimated total (\$6,060,000 federal and \$4.5 million state)

#### **ACTION PO - 1.6**

***Develop a comprehensive strategy to reduce pesticides coming into the Estuary.***

**Who:** State Water Resources Control Board, Regional Water Quality Control Boards (RWQCBs), Cal EPA, Department of Pesticide Regulation (DPR), Department of Fish and Game, U.S. EPA, county commissioners, county agricultural commissioners, and the state legislature

**What:** Before a new pesticide is registered for use in risk situations (e.g., rice cultivation), pesticide registrants should demonstrate to the DPR and RWQCBs that use of the pesticide will not result in discharges to surface waters that violate Basin Plan objectives.

Water Quality Control Plans should contain numerical objectives for all pesticides detected in the Estuary. Biototoxicity monitoring should continue to be used or supervised by the RWQCBs, DPR, or other state agencies to ensure the data are reliable. When control programs are required to prevent pesticide discharges from exceeding water quality standards, the costs for the development of the control program and the monitoring needed to verify that the control program is effective should be borne directly or indirectly by the user and manufacturer of the pesticide. Costs of the monitoring should be borne by pesticide manufacturers and users through funds from a mill tax on pesticide sales. Legislation should be enacted to provide adequate funds to supplement the mill tax where necessary.

Biototoxicity monitoring should continue to be used to identify waters where pesticides and other toxic materials are impacting aquatic life. Water Quality Control Plans should contain numerical objectives for all pesticides in the Estuary. Toxicity identification evaluations can then be used to find the chemicals that are causing adverse impacts.

U.S. EPA should ensure that there is an approved laboratory analysis method for every pesticide and significant breakdown products. The detection level should be below concentrations that may impact beneficial uses.

When a pesticide is detected in waters of the Estuary, the DPR should work with the RWCQB and other appropriate parties to determine whether water quality objectives are violated and to develop control measures, if necessary, that will result in compliance with these objectives.

The U.S. EPA should be notified of detection of pesticides in waters of the San Francisco Estuary. The U.S. EPA should then provide technical and monetary support for the development of any necessary control measures and determine whether the local problem should result in a change in pesticide regulation and label directions.

Contamination of surface water as a result of drift from aerial applications should be quantified. Drift in aerial applications that results in violations of the Basin Plan objectives should be mitigated.

Pesticide users should work with the county agricultural commissioners to keep informed on new control measures. Agricultural Extension and other education and outreach programs can be used to show pesticide users best application methods. The DPR should take strong enforcement action against pesticide users who do not comply with label instructions and other use restrictions.

Where control effort is based on voluntary use of specified management practices versus mandatory restrictions, goals and a timetable must be set to gauge progress toward compliance. Failure to meet the goals on time should result in a regulatory-based program.

**When:** As soon as possible

**Cost:** \$46,920,000 estimated total (\$14,420,000 federal and \$32.5 million state)

## **B. Pollution Control and Reduction**

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### **Objective PO-2**

***Improve regulatory systems for point and nonpoint source pollution control.***

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#### **ACTION PO - 2.1**

***Pursue a mass emissions strategy to reduce pollutant discharges into the Estuary from point and nonpoint sources and to address the accumulation of pollutants in estuarine organisms and sediments.***

**Who:** San Francisco Bay Regional Water Quality Control Board and the Central Valley Regional Water Quality Control Board, U.S. EPA, State Water Resources Control Board, and local pollution control authorities

**What:** A mass emissions strategy should be developed that includes the following elements, where appropriate:

1. The RWQCBs should implement waste load allocation projects for all water bodies in the Estuary that do not meet water quality standards for



pollutants.

2. Pretreatment programs should be expanded to control persistent, accumulative pollutants and to include mass limits.
3. The RWQCBs should impose numerical effluent limitations, toxicity control requirements for point sources, BMPs for nonpoint sources, and other regulatory and enforcement mechanisms to assure compliance with adopted standards.
4. Evaluate marketable discharge permits to ensure that the capacity of the ecosystem to accept pollutants is not exceeded.

**When:** As soon as possible

**Cost:** \$8,260,000 estimated total (\$60,000 federal and \$8.2 million state)

#### **ACTION PO - 2.2**

***Adopt water quality objectives that effectively protect estuarine species and human health.***

**Who:** State Water Resources Control Board, San Francisco Bay Regional Water Quality Control Board, Department of Health Services, and California EPA

**What:** The State Board and Regional Water Quality Control Board should, to the extent provided by law, revise their Water Quality Control Plans so that water quality objectives protect the most sensitive species in the Estuary. Objectives should be developed for all pollutants of concern that are discharged into the Estuary, taking into account data regarding species sensitivity and, where this sensitivity is unknown, use an appropriate safety factor in the standards to account for this uncertainty. In the long term, toxicity test information and additional research should be performed in order to determine overall species sensitivity.

The RWQCBs should take into account the proportion of receiving water species and conditions that have been tested, known or suspected interactions between pollutants, other sources of stress to receiving water populations, natural variability, and other relevant factors. The RWQCBs should also perform a hazard assessment of affected receiving waters and species.

Water quality objectives for appropriate water body segments for copper, selenium, mercury, and others should be developed and adopted to address bioaccumulation effects and protect aquatic life. Objectives should be developed to protect against potential adverse effects due to accumulation through the food chain.

Chemical-specific or toxicity-based sediment quality objectives that are protective of aquatic life for the Bay and Delta should be developed and adopted. Tissue levels that protect human health and predator species against adverse effects from contaminated fish or shellfish should be adopted.

**When:** Immediately through 1994

**Cost:** \$2,412,000 estimated total (\$2,412,000 state)

#### **ACTION PO - 2.3**

***Identify and control sources and sinks of selenium and mercury where they are accumulating in aquatic populations in the Estuary.***

**Who:** State Water Resources Control Board, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, and the Soil Conservation Service (with assistance from California Department of Fish and Game)

**What:** Sources of mercury into the Estuary need to be identified and controlled. Loading of selenium from petroleum refineries, agriculture, sewage treatment, and other identified sources discharging to the Estuary must also be reduced. The State and/or Regional Boards should fund and/or carry out necessary investigations to identify the source(s) of selenium (e.g., oil refineries, agricultural return flows, etc.) and implement necessary regulations to control its discharge. Source loads and areas of accumulation should also be identified.

Based upon results obtained in monitoring bioaccumulation of selenium, discharge permits for petroleum refineries and other significant dischargers need to include mass emission limitations for selenium. The control strategy should include management practices and waste discharge requirements as necessary to limit selenium in agricultural subsurface drainage to reduce selenium loadings to the Delta and attain water quality objectives for selenium in the San Joaquin River.

**When:** 1992-1997; control measures: 1997-2002

**Cost:** \$21,400,000 estimated total (\$8.4 million federal and \$13 million state)

**ACTION PO - 2.4**

***Improve the management and control of urban runoff from public and private sources.***

**Who:** San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, and local agencies

**What:** A comprehensive urban runoff management program should include the following elements, which emulate the current baseline NPDES program:

- 1) Baseline control programs with a focus on prevention in all watersheds;
- 2) Comprehensive control programs with a focus on prevention and remediation beginning with selected municipalities in urban watersheds;
- 3) Industrial activity control programs;
- 4) New development construction control programs;
- 5) Education and outreach; and
- 6) Forum to address barriers.

**Baseline Control Programs**

These programs should consider:

- 1) Operation and maintenance of new and existing public and private storm

drain systems;

2) Ordinances and general procedures to require the control of runoff from new and existing development and significant redevelopment both during and after construction; and

3) Measures towards educating the public.

The Regional Boards should require municipalities to submit annual reports documenting program activities. These programs should be integrated into the implementation of watershed management plans, and the Regional Boards should consider issuing waste discharge requirements to municipalities that do not demonstrate adequate progress or fail to participate in watershed management. The Regional Boards should consider enforcement actions.

### **Comprehensive Control Programs**

In addition to baseline control program elements, comprehensive control programs should include:

1) Measures to reduce pollutants in runoff to the maximum extent practicable from commercial, residential, and industrial areas;

2) Measures to eliminate illicit connections and illegal dumping into storm drain systems;

3) Measures for operating and maintaining public highways to reduce pollutants in runoff; and

4) Measures to reduce pollutants in discharges associated with the application of pesticides, herbicides, and fertilizer.

The requirements of the comprehensive control program are intended to be consistent with NPDES regulations for municipal stormwater discharges. The Regional Boards should issue NPDES permits to municipalities in urban watersheds for the implementation of comprehensive control programs and include transportation entities as responsible parties.

### **Industrial Activity Control Programs**

The Regional Boards should consider issuing general or individual NPDES permits for stormwater discharges from categories of industry or individual facilities that pose a significant threat to water quality. The Regional Boards should also consider issuing NPDES permits for stormwater discharges from facilities that are not currently required in the federal regulations to obtain permits (such as automotive operations), but pose a significant threat to water quality. These permits should include specific requirements beyond those in the existing industrial stormwater general permits as necessary to meet water quality objectives. Regional Board actions should be coordinated with municipalities required to implement comprehensive control programs.

### **New Development Construction Control Programs**

New development construction will be regulated by the SWRCB's general permit to address the discharge of construction waste material and pollutants after construction is completed. Storm Water Pollution Prevention Plans (SWPPPs) shall include specific measures for erosion and sediment control,

post-construction stormwater management, waste management and disposal, and ongoing maintenance and inspection of pollutant control measures.

Municipalities should include in their plan development and approval process pollution measures to assure implementation of the SWPPP.

### **Education and Outreach**

The RWQCBs and local agencies should develop collaborative programs to inform the public, commercial entities, and industries on the proper use and disposal of materials and waste and correct practices of urban runoff control.

### **Forum to Address Barriers**

Establish a forum to address and remedy, where appropriate, administrative and regulatory barriers that inhibit implementation of urban runoff control measures, including construction, operation, and maintenance of detention/retention devices, wetlands, and paved surfaces.

**When:** As soon as possible

**Cost:** \$36,660,000 estimated total (\$660,000 federal and \$36 million state)

### **ACTION PO - 2.5**

***Develop control measures to reduce pollutant loadings from energy and transportation systems.***

**Who:** Air Resources Board, Metropolitan Transportation Commission, Bay Area Air Quality Management District, Association of Bay Area Governments, Department of Transportation, local congestion management agencies, and existing hazardous waste control agencies

**What:** The Clean Air Plan and regional and local transportation plans should include measures to control and/or prevent the impact of atmospheric deposition and runoff from paved surfaces. Potential contributions to water pollution need to be considered in the development of air pollution standards, such as those involving automotive emissions. Regional programs need to be created to ensure proper recycling of waste oil (e.g., a deposit system for motor oil). Mass transportation systems need to be supported to reduce personal automobile use. Transportation control measures should be implemented.

**When:** 1994

**Cost:** \$200,000 estimated total (\$200,000 state)

### **ACTION PO - 2.6**

***Improve the management and control of agricultural sources of toxic substances.***

**Who:** Cal EPA, Department of Food and Agriculture, Department of Fish and Game, State Water Resources Control Board, Central Valley Regional Water Quality Control Board, U.S. Soil Conservation Service

**What:** The State and Regional Boards should utilize existing nonpoint programs in developing and implementing Best Management Practices (BMPs). Specifically, better management of agricultural uses of pesticides

(herbicides, fungicides, etc.) is needed to reduce concentrations of these pollutants to below toxic levels in receiving waters. Periodic reviews for the effectiveness of this program should be conducted. Where water quality objectives are not met through BMPs, the RWQCB should consider waste discharge requirements when there is evidence that agricultural drainage is limiting the defined beneficial uses of any body of water.

The California Inland Surface Water Plan and other appropriate policies and laws should be implemented and strengthened where needed to reduce pesticides in the environment.

Regional Boards and water districts should encourage the establishment of legally responsible drainage entities. Farmers could be organized into groups to facilitate water quality monitoring and develop BMP plans to be submitted to the Regional Board for review and approval. These plans could be used to prioritize efforts based upon known or suspected water quality problems and their solutions.

State and Regional Boards should develop an enforceable instream toxicity program. Elements of this program would include:

- 1) Continued and expanded ambient biotoxicity monitoring efforts;
- 2) Relating biotoxicity monitoring to biomonitoring and chemical data; and
- 3) Development of compliance points for measuring chronic toxicity.

**When:** Immediately

**Cost:** \$44,120,000 estimated total (\$28,120,000 federal and \$16 million state)

#### **ACTION PO - 2.7**

##### ***Reduce toxic loadings from mines.***

**Who:** U.S. EPA, Cal EPA, Department of Health Services, State Water Resources Control Board, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, California legislature

**What:** Require the development and implementation of control measures to reduce the discharge of metals associated with sediments, acid mine drainage, or process wastes and require effective closure of inactive mines. The implementation of a program should include measures prioritized by loadings to particular watersheds. Responsible parties and potential sources of funding should be identified. State and federal Superfund programs should give high priorities to these remediation projects to rapidly correct water quality problems as well as human health problems from abandoned mines.

Regional Boards should use state Clean-Up and Abatement Act funds to correct abandoned mine pollutant discharge. Legislation is needed to limit or exempt the Regional Boards and their members from liability for mine clean-up efforts, including implementation through the NPDES Stormwater permits.

**When:** 1994

**Cost:** \$8,600,000 estimated total (\$2.6 million federal and \$6 million state)

**ACTION PO - 2.8**

***Establish a model environmental compliance program at federal facilities within the jurisdiction of the Estuary Project.***

**Who:** Department of Defense, Department of Energy, U.S. EPA, State of California, Department of the Interior, Department of Agriculture, and other active facilities

**What:** The Department of Defense, Department of Energy, U.S. EPA, and the Estuary Project should establish a Memorandum of Understanding (MOU) to create a model federal facilities program within the boundaries of the Estuary Project. The MOU would comprehensively address issues affecting environmental quality of the Bay-Delta. Elements to be included in the MOU are:

- 1) Pollution prevention, including review and revision of contract specifications to allow use of nontoxic or less toxic substitutes by contractors;
- 2) Improved compliance with environmental regulations;
- 3) Stormwater and collection systems;
- 4) Expedited remediation of sites affecting the Bay-Delta; and
- 5) Restoration/creation of wildlife habitat on unoccupied federal land and adequate funds to implement action.

**When:** As soon as possible

**Cost:** \$13,440,000 estimated total (\$13,440,000 federal)

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**Objective PO-3**

***Remediate pollution threats to public health and wildlife in the Estuary.***

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**ACTION PO - 3.1**

***Clean up contaminants presently affecting fish, wildlife, their habitats, and food supplies.***

**Who:** U.S. EPA, State Water Resources Control Board, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, Department of Fish and Game, and U.S. Fish and Wildlife Service

**What:** A comprehensive watershed analysis should be undertaken to evaluate, identify, and reduce toxicity in problem areas. Where toxic agents and sources are known, the resources agencies should immediately seek damages to effect the clean up or remediation of contaminants affecting public trust resources. Immediate emphasis should be placed on clean up of mercury affecting the California clapper rail. Special attention must also be given to selenium and TBT.

**When:** Immediately

**Cost:** \$4,220,000 estimated total (\$1,820,000 federal and \$2.4 million state)

### **ACTION PO 3.2**

***Expedite the clean up of toxic hot spots in estuarine sediments.***

**Who:** State and Regional Water Quality Control Boards, California legislature

**What:** Pursuant to the Bay Protection and Toxic Cleanup Program established by the California legislature, the SWRCB has adopted a workplan to identify and develop clean-up plans for toxic hot spots in bays and estuaries. This clean up or remediation will reduce the potential exposure of aquatic organisms and humans to contaminated sediments. Completion of this work should be a high priority for the Regional Boards. Legislation is needed to require the implementation of the clean-up plans and to identify a funding mechanism. Where responsible parties are known, the resource agencies should seek damages.

**When:** 1994

**Cost:** \$1.5 million estimated total (\$1.5 million federal)

The total estimated cost for the Pollution Prevention and Reduction Program is \$224,112,000.

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*Next Program Area: Dredging and Waterway Modification*  
*[Back to III. Action Plan](#) [CCMP Main Page](#) [SFEP's Main Page](#)*

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*Appendices*  
*[References](#) [Glossary](#) [Clean Water Act](#) [Gaps in Knowledge](#) [Implementing](#)*  
*[Entities](#) [San Francisco Estuary Project Staff](#)*

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*Pages 133- 146*

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